

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Application Review

Issue Date: **TBD**

Region: Mooresville Regional Office
County: Rowan
NC Facility ID: 8000163
Inspector's Name: Melinda Wolanin
Date of Last Inspection: 08/23/2016
Compliance Code: 3 / Compliance - inspection

<p style="text-align: center;">Facility Data</p> <p>Applicant (Facility's Name): Plant Rowan County</p> <p>Facility Address: Plant Rowan County 5755 NC 801 Highway Salisbury, NC 28147</p> <p>SIC: 4911 / Electric Services NAICS: 221112 / Fossil Fuel Electric Power Generation</p> <p>Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V</p>	<p style="text-align: center;">Permit Applicability (this application only)</p> <p>SIP: 15A NCAC 02D .0530(u) NSPS: n/a NESHAP: n/a PSD: .0530(u) PSD Avoidance: n/a NC Toxics: n/a 112(r): n/a Other: n/a</p>
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Contact Data			Application Data
<p style="text-align: center;">Facility Contact</p> <p>Shane Short Compliance Team Leader (704) 278-6657 5755 NC Highway 801 Salisbury, NC 28144</p>	<p style="text-align: center;">Authorized Contact</p> <p>Chris Lane Plant Manager (704) 278-6601 5575 NC 801 Highway Salisbury, NC 28147</p>	<p style="text-align: center;">Technical Contact</p> <p>Daniel Woodard Environmental Engineer (205) 257-6449 600 North 18th Street Birmingham, AL 35291</p>	<p>Application Number: 8000163.16C & .17A Date Received: 12/05/2016 Application Type: Modification (.16C) TIV Renewal (.17A) Application Schedule: TV-Significant Existing Permit Data Existing Permit Number: 08758/T19 Existing Permit Issue Date: 07/15/2016 Existing Permit Expiration Date: 03/31/2019</p>

Total Actual emissions in TONS/YEAR:							
CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2015	7.69	119.78	17.50	184.87	60.68	10.53	7.27 [Formaldehyde]
2014	9.20	123.26	17.52	182.00	59.93	10.30	7.06 [Formaldehyde]
2013	6.30	109.37	16.72	175.38	58.02	9.99	6.89 [Formaldehyde]
2012	7.21	153.64	20.61	218.41	71.60	12.45	8.58 [Formaldehyde]
2011	5.91	127.96	16.74	176.64	58.17	10.05	6.93 [Formaldehyde]

<p>Review Engineer: Russell Braswell</p> <p>Review Engineer's Signature: _____ Date: _____</p>	<p style="text-align: center;">Comments / Recommendations:</p> <p>Issue 08758/T20 Permit Issue Date: TBD Permit Expiration Date: TBD</p>
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1. Purpose of Application:

- .16C

Plant Rowan County (PRC) operates a facility primarily composed of combustion turbines used to generate electricity. PRC plans to make minor upgrades to two of the turbines (units 4 and 5), and has submitted this permit application in order to demonstrate the proposed upgrades do not trigger a PSD review.

The application states that PRC plans to replace and upgrade "worn parts" with new parts referred to by the vendor as "advanced gas path" technology. Furthermore, PRC plans to upgrade control device software for the two turbines with "optimized load path" software.

As a result of these upgrades, PRC expects the overall utilization of the two turbines to increase, thereby increasing facility-wide emissions. The proposed upgrades will not increase the heat input capacity of the turbines. Emissions on heat input basis are not expected to change.

- .17A

PRC currently holds a Title IV Acid Rain Permit (ARP). These permits are issued on a five-year basis, and was most recently submitted in September 2012. PRC submitted this application in order to renew the ARP. PRC specifically requested that the new expiration date be the same as the expiration date of the Title V permit in order to simplify future renewals.

2. Application Chronology:

- December 5, 2016 Application received.
- January 3, 2017 Email sent to PRC representatives regarding the estimated heat inputs in the application, and also the apparent similarity between this application and the .15A application.
- January 12, 2017 Phone call and email from Daniel Woodard and Julie Robinson (representatives of PRC) to address the concerns in the January 3 email.
- January 19, 2017 Email sent to PRC regarding the SO₂ actual and estimated emissions in the application. Daniel Woodard responded by email on February 2.
- February 2, 2017 Email sent to PRC regarding an error in PM calculations in the application. Daniel Woodard submitted minor corrections to the application by email on February 6.
- February 9, 2017 An initial draft of the permit and review were provided to DAQ staff (Tom Anderson, Lori Phillips, Samir Parekh, Denise Hayes, Melinda Wolanin) and to PRC representatives (Scott McMillan, Daniel Woodard). For a summary of comments received, see Attachment 4.
- February 21, 2017 Application .17A received in Raleigh Central Office.
- XXXXXXXX EPA / Public Notice

- XXXXXXXX Permit issued.

3. Permit Modifications/Changes:

The list of changes to the permit can be found in Attachment 1.

4. Regulatory Review:

In order to avoid a PSD review of a modification, the applicant must demonstrate that the modification does not increase emissions of any pollutant above its significant threshold. PRC has taken the following steps in this demonstration: a) establish a baseline, b) calculate the projected change in emissions, and c) calculate the excludable emissions from step 2. In addition, this proposed project has been compared to the recent upgrades to these turbines (see Permit T17, issued by Ed Martin on April 24, 2015) in order to examine the potential for circumvention of the PSD program.

a. Establish baseline actual emissions

15A NCAC 02D .0530(b)(1) defines the baseline actual emissions as the average annual emission rate of that pollutant during "...any consecutive 24-month period selected by the owner or operator within the five year period immediately preceding the date that a complete permit application is received by the Division..." The application establishes the baseline period as June 2014 – May 2016 for NOx and July 2014 – June 2016 for each other pollutant. See Attachment 2 for the detailed calculations of the baseline period and baseline emissions. Note that 02D .0530(b)(1)(A)(v) allows for a different baseline period to be chosen for each pollutant.

b. Calculate the projected change in emissions

PRC estimated the projected change in emissions based on a proprietary "dispatching model". See Attachment 3 for detailed calculations of the projected change in emissions.

c. Calculate the excludable emissions

PRC estimated the expected growth in utilization of the facility based on the same "dispatching model". The emissions associated with this growth are excludable from this analysis. See Attachment 3 for detailed calculations of the excludable emissions. Based on the attached analysis, the projected change in emissions for each pollutant is lower than the respective significance threshold. Therefore, it appears that PSD/NSR review is not required.

d. Potential circumvention of the PSD program

In a 1993 memo to Region V¹, US EPA stated that a facility is not allowed "...to construct a major source or major modification with a minor source permit when there is intent to operate as a major source or modification."² Essentially, a facility is not allowed to split a PSD-applicable project into several, smaller applications in order to avoid PSD requirements. The memo provides several criteria that should be evaluated to determine PSD circumvention, the most relevant of which are 1) filing applications within a short time period, 2) statements from the applicant regarding plans for operation, and 3) the "economic realities" of the separate projects when considered together.

1 "Applicability of New Source Review Circumvention Guidance to 3M – Maplewood, Minnesota"

2 This was paraphrased from a June 28, 1989 federal register notice (54 FR 27274).

1. Filing applications within a short time period

On March 18, 2015, PRC submitted an application to upgrade the "peak fire software" on units 4 and 5. The upgrade was completed on June 1, 2015. The current application was submitted December 5, 2016, approximately 20 months afterwards. The memo suggests that the applicable period should be 12 to 18 months.

2. Statements from the applicant regarding plans for operation

During a phone call with Daniel Woodard and Julie Robinson (representatives of PRC) stated that, at the time of the previous application, PRC was not aware that the proposed upgrades were available. The turbine manufacturer (General Electric) only informed PRC of the potential for upgrades starting in 2016.

3. The economic realities of the separate projects when considered together

The peak fire software upgrade appears to be totally independent of the optimized load path software (which affects the water injection systems) and the advanced gas path upgrades (which improves parts within the turbine).

Based on the above criteria, this application should be considered separately from the June 2015 application.

e. Conclusion

Based on the above analysis, the proposed upgrades do not constitute a PSD-Major modification. The permit will be modified to include a condition that will require PRC to record and report emissions from Units 4 and 5 for five years after the upgrades are completed. This is done to verify that the emission estimates made as part of this application were reasonable.

5. Facility Emissions Review

See Attachment 3 for calculations of the change in actual emissions from the facility.

These upgrades are not expected to change total potential emissions from the facility.

6. Acid Rain Permit

This facility maintains an Acid Rain Permit (ARP) pursuant to Title IV of the Clean Air Act. Although the ARP is included in the Title V permit, compliance with the ARP is entirely determined by US EPA, not NC DAQ.

PRC submitted application .17A in order to renew the ARP. The renewal application specifically requested that the expiration date of the ARP be the same as for the Title V permit.

7. Public Notice/EPA and Affected State(s) Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a

copy of each permit application, each proposed permit and each final permit pursuant shall be provided to EPA.

Also pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice is provided to the public under 02Q .0521 above.

8. Recommendations

Issue permit 08758T20.

DRAFT

Change List

Pages*	Section*	Description of Changes
Throughout	Throughout	<ul style="list-style-type: none">Updated permit numbers/datesChanged "assure" to "ensure" per current DAQ policy.Changed "mmBtu" to "million Btu"
	2.1 B.4.	<ul style="list-style-type: none">Noted that the recordkeeping and reporting for this requirement can be combined with the new Section 2.1 B.5.
	2.1 B.5.	<ul style="list-style-type: none">Added new permit condition for 02D .0530(u) in order to track emissions after upgrades to Units 4 and 5.
	2.1 D.7.e and 2.1 E.5.e	<ul style="list-style-type: none">Corrected MACT Subpart DDDDD stipulations to indicate that the Permittee has completed the Notification of Compliance Status requirements for these sources.
	2.2	<ul style="list-style-type: none">Updated Acid Rain Permit

* This refers to the current permit unless otherwise stated.

Baseline Emissions

The following information is supplied by PRC. The heat input and emission numbers are for Units 4 and 5 combined.

Month	Heat Input* (million Btu/month)	SO2 emitted** (ton/month)	NOx emitted** (ton/month)	
Jun-14	(n/a)	(n/a)	15.18	
Jul-14	1,742,779	0.52	10.26	
Aug-14	1,909,021	0.57	10.80	NOx baseline period: June 2014 - May 2016 9.56 tons emitted per month on average. 114.7 tons per year average annual emission rate.
Sep-14	1,908,934	0.57	10.78	
Oct-14	1,738,616	0.52	9.96	
Nov-14	2,067,527	0.65	10.00	
Dec-14	2,105,659	0.63	10.09	
Jan-15	2,124,229	0.64	10.35	Heat input baseline period: July 2014 - June 2016 1,834,588 million Btu/month average heat input. 22,015,053 million Btu per year average annual heat input rate.
Feb-15	2,006,939	0.60	9.27	
Mar-15	2,058,499	0.62	11.00	
Apr-15	1,755,348	0.53	9.05	
May-15	1,661,288	0.50	9.41	SO2 baseline period: July 2014 - June 2016 0.55 tons emitted per month on average. 6.6 tons per year average annual emission rate.
Jun-15	1,893,809	0.57	10.69	
Jul-15	2,089,413	0.63	10.23	
Aug-15	2,031,746	0.61	11.15	
Sep-15	1,280,968	0.39	5.92	
Oct-15	142,655	0.04	0.65	
Nov-15	35,046	0.01	2.24	
Dec-15	2,048,437	0.62	10.73	
Jan-16	2,378,261	0.71	10.94	
Feb-16	2,302,115	0.69	10.39	
Mar-16	1,930,619	0.58	9.01	
Apr-16	2,275,237	0.68	10.50	* fuel use records, total time spent firing fuel oil is 5 hours across this entire period
May-16	2,305,398	0.69	10.81	
Jun-16	2,237,562	0.67	(n/a)	** CEMS report

Pollutant	Baseline Annual Heat Input (million Btu/yr)	Emission Factor (lb/million Btu)	Baseline Actual Emission Rate (ton/yr)
NOx	n/a*	1.06E-02 **	114.7
SO2	n/a*	6.00E-04 **	6.6
CO	22,015,053	1.80E-02 ***	198.1
VOC	22,015,053	1.70E-03 ***	18.7
PM/PM10 (front half)	22,015,053	5.50E-03 ***	60.5
PM10/2.5	22,015,053	7.80E-03 ****	85.9

* calculated using CEMS data

** emission factors based on recorded CEMS and fuel use data

*** emission factors based on permitted BACT limit

**** emission factor based on "front half" PM + manufacturer's specification for condensible PM

Projected Actual Emissions

Based on the PRC's dispatching model³, PRC predicts that during in the five years following the completion of the planned upgrades, the highest level of heat input over a rolling 12-month period will occur during December 2018 – November 2019. The predicted heat input during that time is **25,286,567 million Btu**. During this period, PRC predicts that 100% of the heat input will come from natural gas.

Pollutant	Projected Annual Heat Input (million Btu/yr)	Emission Factor (lb/million Btu)	Projected Actual Emissions (ton/yr)
NOx	25,286,567	1.06E-02	134.0
SO2	25,286,567	6.00E-04	7.6
CO	25,286,567	1.80E-02	227.6
VOC	25,286,567	1.70E-03	21.5
PM/PM10 (front half)	25,286,567	5.50E-03	69.5
PM10/2.5	25,286,567	7.80E-03	98.6

Note that these upgrades will not change the turbines' maximum heat input capacity or emission rates on a per-heat-input basis. Therefore, the same emission factors can be used.

In the application, PRC points out that the definition of "projected actual emissions" specifically excludes emission increases that an existing unit could have accommodated during the baseline period had the project not been completed (see 40 CFR 51.166(b)(40)(ii)(c)). Based on the same dispatching model, PRC predicts that, even if the project associated with this application were not completed, the heat input during the December 2018 – November 2019 period would be **24,158,312 million Btu**. During the baseline period, the highest monthly heat input rate was 2,378,261 million Btu/month, which equates to 28,539,132 million Btu/yr. This shows that the facility could accommodate this proposed growth number. Therefore, the projected change in emissions *due to this project* can be calculated as the difference in the two annual heat inputs:

Pollutant	Emission Factor (lb/million Btu)	Projected Actual Emissions (ton/yr)	Projected Excludable Emissions (ton/yr)	Projected Change in Emissions (ton/yr)	Significance Threshold (ton/yr)
NOx	1.06E-02	134.0	128.0	6.0	40
SO2	6.00E-04	7.6	7.2	0.3	40
CO	1.80E-02	227.6	217.4	10.2	100
VOC	1.70E-03	21.5	20.5	1.0	40
PM/PM10 (front half)	5.50E-03	69.5	66.4	3.1	25
PM10/2.5	7.80E-03	98.6	94.2	4.4	15
Projected Operations	25,286,567	million Btu/yr with upgrades			
	24,158,312	million Btu/yr without upgrades			

³ In a phone call on January 12, 2017, Daniel Woodard and Julie Robinson explained that the "dispatching model" is a proprietary computer generated model that predicts future utilization of Southern Power Company's (SPC) facilities. SPC uses the dispatching model to make business decisions.

Comments Received on the Initial Draft

- Lori Phillips, by email on February 13, 2017

1. Lori pointed two updates: a) "assure" should generally be replaced with "ensure" and b) "mmBtu" is not correct and should be replaced with "million Btu" or "MMBtu".

Response: Fixed.

2. Lori pointed typos in the permit and review.

Response: Fixed.

- Daniel Woodard, by email on February 23, 2017

1. Daniel pointed out typos in the new 02D .0530(u) permit condition.

Response: Fixed.

2. Daniel asked that the following text be added to both 02D .0530(u) conditions: "One record and one report may be used to satisfy the requirements of both Section 2.1.B.4 and Section 2.1.B.5 for each calendar year to which both sections apply."

Response: I agree with the sentiment of this request, if not the wording. I have noted in both monitoring and reporting sections that they can be combined.

3. Daniel corrected the technical contact listed in the review.

Response: Fixed.

4. Daniel pointed out typos in the review.

Response: Fixed.

- TaShundra Robinson (employee of Southern Power Company), by phone and email on February 23, 2017

1. TaShundra pointed out that the permit conditions for MACT Subpart DDDDD note the date PRC completed the required energy assessment, but do not note the date the Notification of Compliance Status was submitted. She asked that the permit include this date, and that doing so would make the annual compliance certification simpler.

Response: I agree with this change.